AWIPS MODIFICATION NOTE 15, REVISION C (for Electronics Technicians)
Maintenance, Logistics, and Acquisition Division
W/OPS12: JCS

SUBJECT	:	Linux Workstation Installation Procedures.
PURPOSE	:	To provide instructions on replacing old HP workstations (WS) with newer Linux workstations (LX).
EQUIPMENT AFFECTED	:	HP workstations and monitors, high speed local area network (LAN) switch, and AWIPS.
PARTS REQUIRED	:	IBM workstations, LCD monitors, Cat5e cables, and upgrade kits (for sites with existing IBM LXs). GTSI/IBM will drop ship the workstations, upgrade kits, and monitors to the sites. Northrop Grumman IT (NGIT) will ship the remaining parts as a Field Modification Kit (FMK) in 1 or 2 boxes, depending on the number cables being shipped.
SPECIAL TOOLS REQUIRED	:	Standard site tool kit.
MODIFICATION PROCUREMENT	:	None.
EFFECTIVITY	:	All AWIPS WFOs, RFCs and regional headquarters.
ESTIMATED TIME REQUIRED	:	2-3 hours per LX installation
EFFECT ON OTHER INSTRUCTIONS	:	Modification Note 15, Revision C supercedes Revision B. Revision C adds Section F (p.23) to install OB2.3 security patches. Refer to AWIPS Information Note 17, Revision A for disposal of old HP workstations. File this note in EHB-13, section 5.1.
AUTHORIZATION	:	The authority for this modification note is Request for Change AB683.
VERIFICATION STATEMENT	:	Modification Note 15, Revision C was tested at the National Weather Service Headquarters NHDA and NMTW, Silver Spring, MD (SLVM2), Central Region Headquarters, Kansas City, MO (BCQ), RFC Portland, OR (PTR), and WFOs Las Vegas, NV (VEF) and San Juan, PR (SJU).

Installation Guidelines

1 ESAs should schedule the workstation replacements with their AWIPS regional focal points.

2 AWIPS regional focal points should coordinate the workstation replacements using Netscape calendar set aside for AWIPS software upgrades. Directions for accessing Netscape calendar can be found at http://calendar.netscape.com. Scheduling should be done in the form of **LX-*xxx***, where ***xxx*** is the site ID.

3 Sites must coordinate the LX installation with their regional or NCEP Center AWIPS focal point. COMT, the Training Center, systems at WSH, and the OSF should schedule their upgrade themselves using the calendar feature on Netscape (see guideline 2 for Netscape address).

4 A maximum number of 5 sites per day will be upgraded in the AWIPS time-frame noted in guideline 3.

5 NCF/NGIT upgrade support is available from 7 a.m. to 7 p.m. EST, Monday through Thursday. No NCF support will be provided for install activities on Fridays.

6 OCONUS sites requiring installation assistance outside the set support hours on Thursdays must coordinate with the NCF a day in advance.

7 For each LX, 5 power receptacles are necessary. The new speakers use a transformer that will take more than one receptacle in a power strip.

8 If any of the installation instructions require further clarification, call the NCF.

9 Sites are discouraged from retaining the old HP workstations on the AWIPS LAN. If they really must have them, then a Request-for-change (RC) for a new IP address must be submitted and approved (RC forms can be found at http://rclist.noaa3.awips.noaa.gov). A cable to connect to the new LAN (not the current FDDI ring connection) is also needed, and maintenance is the site's responsibility.

10 The installations must be done sequentially in workstation order and initially, LX1 must replace WS1 and LX2 must replace WS2 (the upgraded LX1 and LX2). After the installation, sites may elect to physically move the LX1 and LX2 to another position (to have the newest workstations at the hot spots) but the names must remain the same. The LXs will use the old workstation IP addresses. **Call the NCF when physically moving the new workstation.**

11 HP workstation maintenance will be terminated at the end of workstation installs.

12 **Review the entire modification note before performing the installation.**

GENERAL

Call the NCF before performing this installation. Verify with them that the FDDI ring is functional and that there are no existing problems. Read each step **thoroughly** before performing a procedure. If errors are encountered, **DO NOT** continue. Call the NCF. Refer to http://www.ops1.nws.noaa.gov/awips_new.htm for the latest modification note update.

NOTE: 1. Sites must be at Release OB2 and have all recent maintenance release patches (including OB2.2) as well as the RFC (or WFO) archiver installed before performing this modification.

Approximately 2-3 hours should be allotted beforehand for laying the cables and backing up the current LX1. Each LX workstation takes approximately 2 to 3 hours to install. Local applications will take additional time. Ensure no severe weather is anticipated during this time. There will be approximately 45 minutes to 1 hour of downtime per LX during the install.

Perform the workstation setup, configurations, and localizations on "the bench" before installing them on the forecast floor to minimize disruption to the site forecast operations. Having LAN connectivity in the back rooms facilitates installation.

HARDWARE ISSUES

If hardware problems are encountered in the initial installations of the Linux workstations or upgrade kits, **DO NOT CALL THE NUMBER ON THE PACKING LIST.**

For all initial hardware failures or missing parts, call Iwan Williams (POC at GTSI) at 800-999-4874, press **1**, then enter the extension **2288**.

After the LXs are in service, maintenance will be handled through the Consolidated Logistics System (CLS) as described in the following section for 'System Support'.

LINUX OS ISSUES (READ BEFORE PROCEEDING!)

The NCF is not responsible for non-baseline Linux software. The NCF is not trained nor has the resources to support RedHat, KDE, or gnome beyond baseline configurations. An example of non-baseline questions that should not be directed to the NCF are: How do I create icons on my desktop for KDE? How do I lower the volume in KDE? How can I change my panel in Gnome? Please direct these questions to the Linux Forum located at:

http://www.ops1.nws.noaa.gov/awips_install.htm

The NCF will support Linux OS issues that prohibited the running of baseline software. An example of such an issue is: Gnome will not start up; KDE hangs upon boot; or I cannot launch a D2D in Gnome.

SYSTEM SUPPORT

The operational support and maintenance concept for the Linux hardware components will differ in some important ways from their existing Hewlett Packard Unix (HP-UX) counterparts. If maintenance is required, site personnel must contact the AWIPS NCF. AWIPS problem resolution and maintenance are centralized at the NCF. The NCF will have monitor and control responsibility for the AWIPS Linux Workstations. Information Technology/ Operations (IT/OPs) monitoring agents currently on the HP workstations will be moved to the new Linux workstations to enable automatic NCF detection of problems. When a fault or problem is discovered by NCF personnel or is phoned into the NCF Help Desk, the problem will be diagnosed by the NCF operators and resolution coordinated with the NWS site representative, if necessary. Often, the NCF can discover problems and correct them without requiring coordination with the site. The NCF will generate a trouble ticket to document and track each problem.

The Linux workstation hardware components are covered by a maintenance contract with the vendor, GTSI through IBM Computer Corporation. The NLSC will stock adequate numbers of spare systems to quickly resolve any hardware problems encountered. **All problems with the Linux workstations must be called into the NCF for tracking of the trouble and resolution of the problems**. If the problem is found to be software related, the problem will be forwarded to the appropriate personnel for resolution. If the problem is hardware related, the site will order a replacement workstation or lowest replaceable unit (LRU) through the Consolidated Logistics System (CLS), and install the new workstation or part once it arrives. The site will pack up the defective workstation or part and ship it to the National Reconditioning Center (NRC) for repair. All hardware troubleshooting will take place at the NRC. The NRC will also coordinate with IBM to come on site and repair the workstation. The site will enter the appropriate data into the Engineering Management Reporting System (EMRS) system (Contact John Merhi for all maintenance data reporting requirements for EMRS at 301-713-1892 x200).

The initial delivery includes 90 days to resolve shipping and infant failure problems from the time the system is shipped from the vendor. Failure to boot constitutes infant failure. Sites should inspect the workstations upon receipt and determine whether they will boot up. For shipping and initial failure problems, a single point of contact (POC) with the vendor, GTSI, will resolve all problems. **If a site finds shipping damage or infant failure, contact the POC, Iwan Williams, at 800-999-4874; press #1 to enter the extension 2288. Also notify the NCF of the problem so it can be tracked.**

PROCEDURE:

A. Prepare Site for Workstation Upgrade

NOTE: 2. Sites running IFPS 14.x should notify their forecasters that the IFPS server will NOT be available during the LX1 upgrade.

3. To save time, the LX1 backup (step 3) and LCD setup (step 2) can be performed while another person lays the cables (step 1).

1. Lay Cables

   Plug in the new Linux workstation Cat5e cables from the High-Speed LAN switches in Rack 5 to the current workstation positions in the operations area.

2. Prepare an Upgrade/Configuration area for upgrading the existing Linux workstations (where applicable) and setting up the new workstations.

   a. Unbox and set-up three LCDs (Figure 1).

   b. Acquire a keyboard, mouse and video “Y” cable from one of the new workstation accessory boxes.

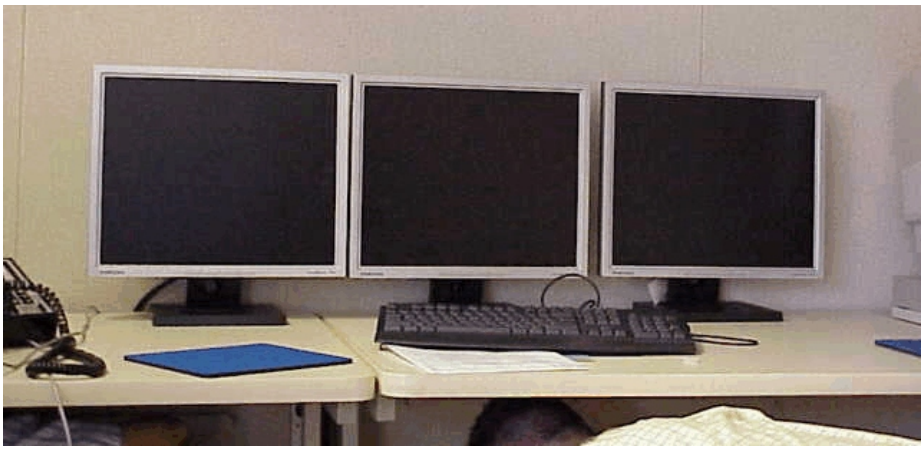


Figure 1

   c. Extend a temporary Cat5 LAN connection from the AWIPS LAN to the configuration area.

3. Backup LX1 for restore of new LXs.

NOTE: 3. Sites will not be able to access px2data during the backup since the script unmounts/mounts px2data. Also, sites cannot export a D2D or use AWIPS software during the backup. The following error message will be displayed if an attempt at accessing px2data is unsuccesful:

**********WARNING PX2DATA IS NOT MOUNTED **********

a. Log into LX1 as `root`. Open a terminal window and enter:

```
mkdir -p /local/install
script -a -f /local/install/Backup_LinuxWS.out
rlogin px2 (as root)
exportfs -i -o rw,no_root_squash lx1:/px2data
exit
```

b. Insert the Linux replacement CD into the CD-ROM and enter:

```
mount /mnt/cdrom
cd /mnt/cdrom
./Backup_LinuxWS.sh
```

NOTE: 4. When the GUI window appears, close it prior to unmounting the CD or the unmount will fail.

4. This script should take approximately 30 minutes to run. Ignore any errors concerning `/awips/ifps`.

```
cd /px2data/LX_REPLACEMENT
tar tvfz SAVED_LX.tar.gz
cd /
rlogin px2 (as root)
exportfs -u lx1:/px2data
exit
```

c. Copy the system script to DS1:

NOTE: 6. In the script below, `ws2lx` is ws2”L”x, not ws2"1"x.

```
cd /mnt/cdrom
ftp ds1 (as root)
cd /tmp
put ws2lx.sh
chmod 555 ws2lx.sh
```

```
quit
exit
cd /
eject cdrom
```

d. Remove the CD from the carrier and close the CD drive.

e. Logout of LX1.

B. Upgrade LX1 and Decommission WS1

Perform the procedures in this section only if the current LX1 (and LX2) are IBM workstations. Sites with Dell LX1 and LX2 workstations follow the procedures in Section D to upgrade LX1 and LX2 from the Dell workstations to the new IBM workstations.

1. Disable CD automount:
   a. Log into LX1 as `root`.
   b. From the *System* menu, select **Programs → Setting →Peripherals →CD Properties**.
   c. Uncheck Box 1 where it says to automount CD on insertion.
   d. Click **Apply** , then click **OK**.
   e. Log out of LX1 as `root`.
   f. Log into LX1 as `awipsusr` and repeat steps **b** through **d**.
   g. Insert the Linux replacement CD into the CD-ROM and eject the CD-ROM using the `eject` command to verify its functionality.
2. Run configuration script on LX1:
   a. Log out of XT1.
   b. Insert Linux workstation replacement CD in CD-ROM.
   c. Log into LX1 as `root` and mount the CD:

NOTE: 7. When the GUI window appears, close it prior to unmounting the CD or the unmount will fail.

7. The `mkdir -p /local/install` command below is only necessary for LX2, as it has already been performed for LX1 in part A.

```
mkdir -p /local/install
script -a /local/install/config-triplehead.out
mount /mnt/cdrom
cd /mnt/cdrom
./installMGAdrivers.sh
```

NOTE: 8. Ignore any errors related to problems with nVidia drivers.

```
./config-triplehead.sh
exit
```

   d. Unmount the CD by typing:

```
cd /
umount /mnt/cdrom
```

e. Remove the CD from the drive (right click the CD-ROM graphic and select **Eject** from the pull-down menu)

3. Perform the following steps to safely shutdown the LX (assuming a gnome session is running):

   a. On the middle LCD monitor, click on the *Big Foot* icon on the gnome panel and select **Log out**. The user's gnome session will exit and the gnome login will appear.

   b. Click the *System* menu and select **Halt...**

4. Install upgrade components in workstation:

NOTE: 10. Upgrade components should be handled while wearing antistatic wrist straps, and workstations should be placed on an antistatic work surface.

9. Sites may wish to vacuum the insides of LX1 and LX2 before performing the upgrade procedures.

   a. Disconnect the power, monitor, keyboard and mouse and place the workstation on an antistatic work surface.

   b. Lay the workstation on its side and remove the cover.

   c. Remove the blank panel from the PCI slot next to the AGP video card slot (Figure 2).

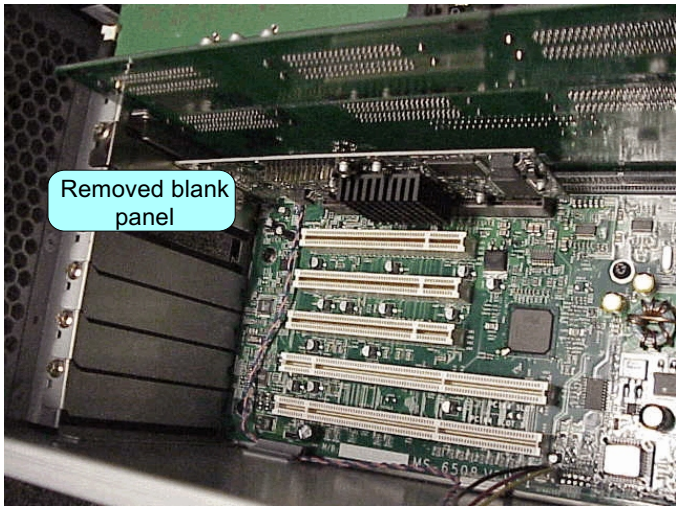


Figure 2

d. Install the nVIDIA card (Figure 3) in the open slot and secure it with the screw removed previously.

Figure 5

e. Remove the memory card from the computer (Figure 4).

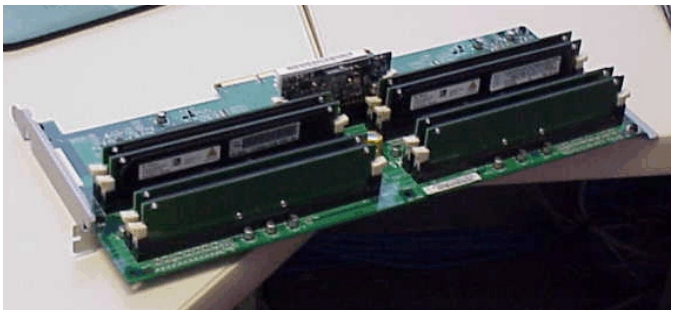


Figure 6

f. Install two 512Mb memory modules in slots 5 & 6. Ensure that the modules are firmly seated in the slots and the C-RIMMs are in slots 7 & 8 (slot numbers are marked on the memory card).

g. Re-install the memory card in the chassis.

h. Connect the LAN cable to LX1 at one end and the WaveSwitch at the other, following the label on the cable.

i. Reconnect the power, monitor, keyboard and mouse and power on the workstation.

j. Verify that the BIOS recognizes the memory upgrade and save the new system configuration by performing the following steps:

   i. Press **F1** key

   ii. Select **System Summary**

   iii. Press **Esc** key

iv. Select **Save & Exit**

v. Reboot the LX. When Linux reboots for the first time after the upgrade, KUDZU will run when it detects the new nVIDIA/nv11 video board. Select "Configure" and Linux will configure the card, update the kernel, and continue the boot process. Ensure no errors occur on the boot.

NOTE: 12. If errors occur while booting, turn off power, remove the new memory and reboot. If it reboots correctly, turn off power and re-insert the memory, ensuring it is seated properly. If the boot fails at this point, the new memory chip may be defective.

vi. Log in as `root` and type:

`cat /proc/meminfo`

vii. Verify that the total memory is 2GB and perform the shutdown procedures in section B, step 3.

k. Turn off the workstation and replace the side cover.

l. Disconnect the power, monitor, keyboard and mouse from the workstation.

5. Remove WS1 and install LX1.

a. Shutdown WS1.

b. Power off WS1 and disconnect the power, monitors, keyboard, and mouse from the workstation.

c. Disconnect the Optical Bypass cables from the workstation and place them in a safe location. **DO NOT** disconnect the FDDI cables from the Optical Bypass. The Optical Bypass will be removed after all workstations have been replaced and the workstations have been patched out of the FDDI ring.

d. Power off XT1.

e. Remove the old WS1 equipment (except the Optical Bypass) from the immediate area.

f. Unbox and set-up three LCDs in the space vacated by the WS1 monitors. Slip the monitor cords through the hole in the stand.

g. Affix one of the device labels (LX1-<*siteid*>) included in the FMK to each of the LCD monitors.

h. Move LX1 (with keyboard and mouse) into position.

i. Connect the LCDs (Figure 1) to LX1 (Figure 5) as follows:

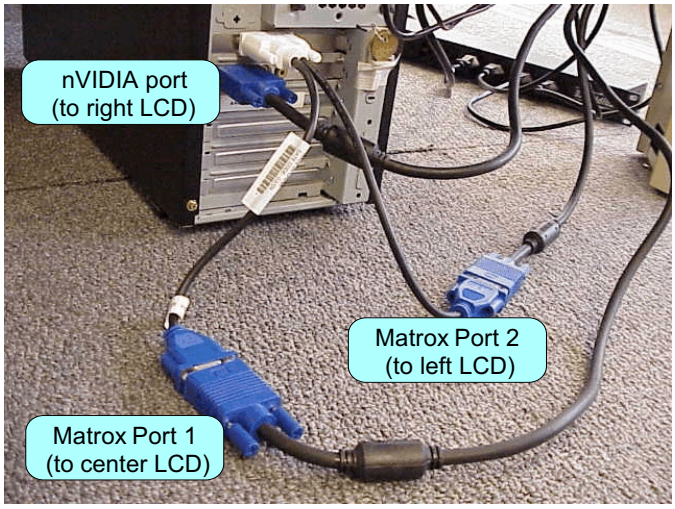


Figure 7

i. Center LCD to port 1 on the "2-port" Matrox card.

ii. Left LCD to port 2 on the "2-port" Matrox card.

iii. Right LCD to the nVIDIA card.

j. Plug the power cord from each component into the receptacle vacated by the WS1 component removed earlier. If a duplex receptacle box was initially provided for the workstation monitors, a power strip is required to provide power for the third LCD. Also note that a pair of "site-provided" PC speakers require AC power.

k. Turn both power switches on (one in front, one in back) for each LCD.

l. Power up LX1.

6. Run system script on DS1 (remove WS, announce new LX):

Log into LX1 as `root`.

NOTE: 13. In the script below, `ws2lx` is ws2"L"x, not ws2"1"x.

`rlogin ds1` (as `root`)
`script -a /home/ncfuser/ws2lx.out`
`cd /tmp`
`./ws2lx.sh <lx>` (where ***<lx>*** is the number of the Linux workstation being added, e.g., **`./ws2lx.sh lx1`**)

NOTE: 14. Prompts for input from the user can be ignored. The script provides all needed input, and takes 15-20 minutes to complete.

exit
exit

NOTE: 15. Check the output files to make sure the script ran correctly. The following message should display:

```
Done Install
ws2lx.sh complete...
```

If any other messages are observed, **call the NCF**.

16. Ignore any connection timeout messages when performing the script on LX1 or LX2.

7. Run activation script on LX:

   a. Insert Linux workstation replacement CD in CD-ROM and enter the following:

   script -a -f /local/install/LX_activate.out
   mount /mnt/cdrom
   cd /mnt/cdrom
   ./ConfigureLX.sh activate (At the prompt, enter the number of the HP workstation being upgraded, ex: for WS1, enter “1")

   b. Perform the following steps to safely reboot the LX (assuming a gnome session is running):

      i. On the middle LCD monitor, click on the *Big Foot* icon on the gnome panel and select **Log out**. The user’s gnome session will exit and the gnome login will appear.

      ii. Click on the *System* menu and select **Reboot...**

NOTE: 16. Ignore the following error if it appears:

```
monNotify: RadarNotify only runs on lx1
Rc: Starting monNotify: failed
```

c. Log back into LX as `root` :

NOTE: 17. Kill the GUI pop-up when it appears at the `mount` command.

```
script -a -f /local/install/postinstall_LX.out
mount /mnt/cdrom
cd /mnt/cdrom
./postinstall_LX.sh
cd /
eject cdrom
```

d. Remove the CD from the tray.

8. Configure LX console port.

a. Type the following:

```
cd /etc
cp -p lilo.conf lilo.conf.pre3H
cp -p /etc/inittab inittab.pre3H

cd /etc/security
cp -p console.perms console.perms.pre3H
```

NOTE: 18. In the following steps, S0 is S-zero, not S-oh

b. Edit the `/etc/security/console.perms` file with `vi` and add `/dev/ttyS0` to the end of the `<console>` line:

Change this:

```
<console>=tty[0-9][0-9]* vc/[0-9][0-9]* :[0-9]\.[0-9] :[0-9]
```

To this:

```
<console>=tty[0-9][0-9]* vc/[0-9][0-9]* :[0-9]\.[0-9] :[0-9] /dev/ttyS0
```

c. Add this entire line to the end of `/etc/inittab`:

```
S0:2345:respawn:/sbin/agetty -L 9600 ttyS0 vt100
```

d. Add the following new line after the entry "`message=/boot/message`" in the `/etc/lilo.conf` file:

```
serial=0,9600n8
```

e. Add the following line to the end of `/etc/lilo.conf` for each of the three kernel entries.

```
append="console=ttyS0,9600"
```

f. Add the following entry to the end of the `/etc/securetty` file:

```
ttyS0
```

g. Type the following for changes to take effect:

`/sbin/lilo`

NOTE: 19. (VERY IMPORTANT) A response of `Added linux*` should be observed. If any other response is received, **call the NCF**.

h. Perform the following steps to safely reboot the LX (assuming a gnome session is running):

i. On the middle LCD monitor, click on the *Big Foot* icon on the gnome panel and select **Log out**. The user's gnome session will exit and the gnome login will appear.

ii. Click on the *System* menu and select **Reboot...**

NOTE: 20. After reboot, all output from the screen is redirected to the console port. Although it may look like the machine is hung, be patient and in a few minutes a login screen displays on the LX monitor.

This completes the console port configuration procedure.

NOTE: 21. The Xyplex console menus are not updated. At this time, the "Workstation" category within the menus contain a mix of HP and Linux workstations. At completion of the Workstation Replacement activity, all "Workstation" console connections will be Linux platforms.

9. Power up XT1.

10. Verify AWIPS functionality.

C. Upgrade LX2 and Decommission WS2

If old LX2 is an IBM M-Pro, repeat Section B

or

If old LX2 is a Dell, proceed to Section D.

D. Install LX3 through LXn and Decommission WS3 through WSn

NOTE: 22. To save time, steps 1 through 4 in this section may be performed while the previous LX is finishing up. **DO NOT** proceed to step 5 until the previous LX is finished.

21. Making a second copy of the replacement CD (using Linux) is helpful in speeding up new workstation installations.

Use this step for LX1 and LX2 if the current LX1 and LX2 are Dell workstations.

To run this part of the install, the site needs to gather several values to input to `ConfigureLX.sh`. Below is what the site needs and the steps to get the values. This can be done on any HP workstation.

Hostname site ID

This is used to set the Linux hostname and should be entered in lowercase.

Example: if the DS1 hostname is **`ds1-orn`**, then the *hostname site id* is **`orn`**.

IP address of the DS1

To obtain this address, from any HP workstation enter:

`nslookup ds1-<siteid>`

where ***<siteid>*** is the hostname site ID. This address should be of the form 165.92.*xy*.5 or 165.92.*xy*.135, where *xy* is a site-specific value.

Example (where the site ID is `orn`):

`nslookup ds1-orn`

IP address of the default gateway

To obtain this address from any HP workstation, enter:

`nslookup router-<siteid>`

This address should be of the form 165.92.*xy*.70 or 165.92.xy.200, where xy is a site-specific value.

1. Stage new LX (LXTEMP)
   a. Open the CPU case, remove the enclosed packing materials, and close the case.
   b. Set up hardware in the Upgrade/Configuration area prepared in Step A.
   c. Connect the LCDs to LXTEMP as follows:

i. Center LCD to port 1 on the “2-port” Matrox card.

ii. Left LCD to port 2 on the “2-port” Matrox card.

iii. Right LCD to the nVIDIA card.

d. Connect to AWIPS LAN.

e. Log out of LX# as `awipsusr`.

f. Configure and load LXTEMP – Restore to LXTEMP from LX#

i. Log into the LX as `root` (password `root`). Change root password to site password by typing the following in a terminal window:

```
passwd
```

ii. From the *System* menu, select **Programs → Setting → Peripherals → CD Properties**.

iii. Uncheck Box 1 where it says to automount CD on insertion.

iv. Click **Apply** , then click **OK**.

v. Type:

```
mkdir -p /local/install
script –a –f /local/install/ConfigureLX.out
```

CAUTION

If configuring the next LX before completing the previous LX#, then the previous LX# setup must be completed through section D, step 7 prior to running the script in the following step.

vi. Insert the Linux Replacement CD into the CD-ROM and enter the following:

NOTE: 24. The CD does not display on the desktop after insertion.

```
mount /mnt/cdrom
cd /mnt/cdrom
./ConfigureLX.sh staging
```

NOTE: 25. Close any pop-up windows that display.

The script prompts for the values mentioned previously (siteid, DS and gateway IP addresses). Enter the values as the script asks for them. Note that the script uses a temporary IP address to stage the systems.

NOTE: 26. Ignore any errors concerning `/awips/fxa/textdemo`.

The values just entered display in the window along with some values for other parameters. Verify that the values are correct. Select **`y`** in response to the prompt.

```
exit
```

vii. Perform the following steps to safely reboot the LX (assuming a gnome session is running):

(1) On the middle LCD monitor, click on the *Big Foot* icon on the gnome panel and select **Log out**. The user's gnome session will exit and the gnome login will appear.

(2) Click on the *System* menu and select **Reboot...**

viii. Log back in as `root` (using site password mentioned in step 1.f.i.). Open a terminal window and type:

```
script -a -f /local/install/Restore_LinuxWS.out
mount /mnt/cdrom
cd /mnt/cdrom
./Restore_LinuxWS.sh   (This can take 5-30 minutes, depending on the size
                        of the tar file.)
exit
script -a -f /local/install/postinstall_LX.out
cd /mnt/cdrom
./postinstall_LX.sh  (Ignore any printing errors.)
```

NOTE: 27. If the script loops the same line over for more than 15 minutes and not the entire configurations menu, and if the first 5 lines of the output file makes note of missing `.environs` or `AWIPS.sh` profiles, **call the NCF**.

```
exit
cd /
eject cdrom
```

ix. Log out of LXTEMP. Log into LXTEMP as `awipsusr`.

x. From the **System Menu**, select **Programs → Setting → Peripherals → CD Properties**.

xi. Uncheck Box 1 where it says to automount CD on insertion.

xii. Click **Apply**, and then click **OK**.

2. Configure LXTEMP console port.

   a. Log onto the LX as `root` and perform the following:

      ```
      cd /etc
      cp -p lilo.conf lilo.conf.pre3H
      cp -p /etc/inittab inittab.pre3H
      cp -p /etc/securetty securetty.pre3H
      cd /etc/security
      cp -p console.perms console.perms.pre3H
      ```

   b. In steps c through g, edit the files mentioned with the changes that follow.

NOTE: 28. In the following steps, S0 is S-zero, not S-oh

   c. Edit the **/etc/security/console.perms** file with `vi` and add **/dev/ttyS0** to the end of the **<console>** line:

      <console>=tty[0-9][0-9]* vc/[0-9][0-9]* :[0-9]\.[0-9] :[0-9]

      To this:

      <console>=tty[0-9][0-9]* vc/[0-9][0-9]* :[0-9]\.[0-9] :[0-9] /dev/ttyS0

   d. Add this entire line to the end of **/etc/inittab**:

      S0:2345:respawn:/sbin/agetty -L 9600 ttyS0 vt100

   e. Add the following line after the entry "**message=/boot/message**" in the file **/etc/lilo.conf**:
      serial=0,9600n8

   f. Add **console=ttyS0,9600** to the end of the last line (append) in the file **/etc/lilo.conf**. The resulting line reads:

      append="hdc=ide-scsi console=ttyS0,9600"

   g. Add the following entry to the end of the `/etc/securetty` file:

      ttyS0

   h. Type the following for changes to take effect:

      /sbin/lilo

      Ignore any duplicate entry messages.

NOTE: 29. (VERY IMPORTANT) A response of `Added linux*` should be observed. If any other response is received, **call the NCF**.

   i. Perform the following steps to safely reboot the LX (assuming a gnome session is running):

i. On the middle LCD monitor, click on the *Big Foot* icon on the gnome panel and select **Log out**. The user's gnome session will exit and the gnome login will appear.

ii. Click on the *System* menu and select **Reboot...**

NOTE: 30. After reboot, all output from the screen is redirected to the console port. Although it may look like the machine is hung, be patient and in a few minutes a log in screen displays on the LX monitor.

This completes the console port configuration procedure.

NOTE: 31. The Xyplex console menus will not be updated. At this time, the "Workstation" category within the menus contain a mix of HP and Linux workstations. At completion of the Workstation Replacement activity, all "Workstation" console connections will be Linux platforms.

3. Log out of LXTEMP and log back in as `awipsusr`.

   a. Start D2D and load a product to verify its functionality. If products are not available, re-run the **`./postinstall_LX.sh`** script from section D, step 1.g.viii.

   b. Log out of LXTEMP.

4. Perform the following steps to safely shutdown the LX (assuming a gnome session is running):

   a. On the middle LCD monitor, click on the *Big Foot* icon on the gnome panel and select **Log out**. The user's gnome session will exit and the gnome login will appear.

   b. Click on the *System* menu and select **Halt...**

   Wait until the disk light ceases flickering before powering down.

5. Remove WS# and install LX#.

   a. Shutdown WS# by typing **`shutdown -h -y 0`**.

   b. Power off WS# and disconnect the power, monitors, keyboard and mouse from the workstation.

   c. Disconnect the Optical Bypass cables from the workstation and place them in a safe location. **DO NOT** disconnect the FDDI cables from the Optical Bypass. The Optical Bypass is removed after all workstations have been replaced and the workstations have been patched out of the FDDI ring.

   d. Power off XT#.

   e. Remove the old WS# equipment (except the Optical Bypass) from the immediate area.

f. If this LX is a replacement for a Dell LX1 or LX2, power down and remove the Dell LX.

g. Unbox and set-up three LCDs in the space vacated by the WS# monitors. Affix one of the device labels (LX#-<*siteid*>) included in the FMK to each of the LCD monitors.

h. Move LX# (with keyboard and mouse) into position.

i. Affix one of the device labels included in the FMK to the workstation tower.

j. Connect the LCDs to LX# as follows:

   i. Center LCD to port 1 on the "2-port" Matrox card.

   ii. Left LCD to port 2 on the "2-port" Matrox card.

   iii. Right LCD to the nVIDIA card.

   iv. Connect the LAN and the Monitoring & Control (M&C) cables to LX#.

k. Plug the power cord from each component into the receptacle vacated by the WS# component removed earlier. If a duplex receptacle box was initially provided for the workstation monitors, the receptacle box is required to provide power for the third LCD. It also must be noted that a pair of PC speakers will require AC power.

l. Connect the LX# LAN cable into the high speed LAN switch 1 or 2 following the label on the cable.

m. Power up LX#.

6. Run system script on DS1 (remove WS, announce new LX):

   Log into workstation as `root`.

   In the script below, `ws2lx` is ws2”L”x, not ws2"1"x.

   `rlogin ds1` (as `root`)
   `script -a /home/ncfuser/ws2lx.out`
   `cd /tmp`
   `./ws2lx.sh` <*lx*> (where ***<lx>*** is the number of the Linux workstation being added, e.g.,**`./ws2lx.sh lx1`**)

NOTE: 32. Prompts for input from the user can be ignored. The script provides all needed input, and takes 15-20 minutes to complete.

   `exit`
   `exit`

NOTE: 33. Ignore any connection timeout messages when performing the script on LX1 or LX2. An example of an error message is shown below:

```
Error!  Workstations not set.  Initial installation variable
not set.  Do you want to continue anyway (Y/n)?
```

7. Run LX activation script on LXTEMP (renames and re-IPs)

   a. Log into LX as `root`.

   b. Insert Linux Workstation Replacement CD in CD-ROM and enter the following.

```
script -a -f /local/install/LX_activate.out
mount /mnt/cdrom
cd /mnt/cdrom
./ConfigureLX.sh activate
```

   Reply to the prompts.

   c. Type **`exit`** and follow the steps in section D, step 2.i. for a safe reboot.

   d. Log back into LX as `root`:

```
mount /mnt/cdrom
script –a –f /local/install/postinstall_LX.out
cd /mnt/cdrom
./postinstall_LX.sh
exit
cd /
eject cdrom
```

   Follow the steps in section D, step 2.i. for a safe reboot.

8. After the LX reboots, enter the following to mount the `/awips/hydro` directory (to be performed at RFCs only):

```
rlogin px1 -l root
cd /var/tmp
script -a -f px_ms_update.out
clustat
```

NOTE: 34. Verify that the cluster is up and packages are running. The location of each package is not important since the next script will relocate the packages to their normal mode location. The following script also updates `/etc/fstab` at RFCs to mount `/awips/hydro` on DS, WS, LX, and AX platforms. If either package is not running, **DO NOT** proceed. Contact NGIT support.

```
./px_ms3.sh
```

9. Power up XT#

10. Verify AWIPS functionality.

E. Verify Xyplex connections to LXs and repeat Section D for LX4 through LXn (or LX2 through LXn if the original LX1 and LX2 are Dell workstations).

F. Install OB2.3 security patches

Sites installing OB2.3 before performing the Linux workstation replacement must re-run the following script after the workstation replacement:

`rlogin px2-<site> -l root` (where ***<site>*** is the Site ID)

```
cd /data/local/ROB2.3
script -a -f installLX_SecurityPatches.out
./installLX_SecurityPatches.sh lx
exit
```

NOTE: 35. The above script will install patches on ALL LXs. The script can also be run on an individual platform or a "site-specific" platform, as long as the device is ping-able. This is needed for workstation recoveries.

G. Removing FDDI connections from FDDI ring

After all HP workstations have been replaced by the appropriate Linux workstation the old workstation FDDI connections must be removed from the FDDI ring using the following procedure:

1. At the FDDI patch panel in the DS1 rack, unplug the patch cable from the "B" port of the last workstation in the ring (the other end of this cable should be connected to the "A" port of HUB1).
2. Unplug the patch cable from the "B" port of AS2 and insert the cable removed in the above step.
3. Contact the NCF and have them verify the state of the remaining FDDI ring.
4. After the NCF has certified the FDDI ring, disconnect the old workstation FDDI cables from the back side of the FDDI Patch Panel and the remaining workstation patch cables from the front side of the FDDI Patch Panel.
5. Pull the old workstation FDDI cables from the LXs. Disposal or alternate use of these cables is at the site's discretion.
6. Disconnect the Optical Bypass units from the FDDI cables in the Opns Area and place the bypass units with the old HP workstations.

NOTE: 36. For reference post-workstation installs, a "Frequently Asked Questions" (FAQ) section will be posted at the following website: http://www.ops1.nws.noaa.gov/awips_install.htm

H. Instructions for erasing the hard drives on the HP workstations

NOTE: 37. All sites must perform the following procedures **after** the successful installation of Linux workstations and **before** the disposal of the HP workstations. Refer to Information Note 17 for disposal of old HP workstations.

This procedure assumes that the site has the portable CD drive with the **Install and Core OS** CD and that the graphic monitors are plugged into the HP workstation.

For the purposes of booting a J200/J210 HP Workstation to the graphic monitor, use the **TOC** button in the back of the device by pressing it once during reboot. When the LCD display gets to `INIT C440`, the second line will indicate where the display is being sent. If the display is `RS-232(A or B)`, then the Xyplex port is being used (one of the 2 console ports). At the time the RS-232 message is displayed, press the **TOC** button once. It will cause the workstation to restart its boot up and switch the display to the graphic monitor.

To run `mediainit` on the disk(s) of the workstation, follow these steps:

1. Connect the CD drive to the workstation.

2. Insert the CD labeled **HP-UX Install and Core OS Software** (dated July 1996) in the CD drive.

3. Reboot the device, or just power it on by typing the following at the terminal:

   `/etc/reboot`

4. Press any key to interrupt the boot process.

   (The search will look similar to the example below which was taken from a workstation with 2 internal disks)

```
Main Menu: Enter command or menu > sea
Path Number       Device Path    Device Type
P0  core.FWSCSI.6.0    SEAGATE    ST32430W
P1  core.FWSCSI.5.0    SEAGATE    ST32430W
P2  core.SCSI.2.0 TOSHIBA        CD-ROM XM-4101TA
```

5. Select the CD as the boot device and run the `mediainit` utility:

   `Main Menu: Enter command or menu >` **`bo p2`** (or whatever the CD-ROM *p#* is)
   `Interact with IPL (Y or N?)>` **`n`**

NOTE: 38. User may be prompted to select the keyboard type.

6. From the *Install* menu, select **Run a Recovery Shell** and type:

```
loadfile mediainit
```

For the workstation's root disk, type:

```
mknod media c 188 0x006000
mediainit -v media
```

If the workstation has a secondary disk, type:

```
mknod media1 c 188 0x005000
mediainit -v media1
```

NOTE: 39. This takes about 50 minutes for each 2-GB disk (95 minutes for a 4 GB disk).

If the TOC button is not allowing a transition from the RS-232 port to the graphic monitor, re-attach the workstation to the Xyplex and access the boot menu through the Xyplex console. Type the following at the workstation's boot menu:

```
pa con graphics0
pa key ps2
reset
```

At this point, the workstation will reboot to the graphic monitor. Remove the workstation from the Xyplex and follow the instructions above using the graphic monitor. If the graphic monitor is still not functioning correctly, call the NCF.

This completes the procedure for erasing the HP workstation hard drives.

REPORTING INSTRUCTIONS:

Report the completed modification using the Engineering Management Reporting System (EMRS) according to the instructions in NWS Instruction 30-2104, Maintenance Documentation, Part 4, Appendix F. Record serial numbers of all newly installed LX workstations in block 15. As an additional guide, use the information in the table below.

Block #	Block Type	Information
5	Description	All preparation, installation, and post install activities associated with the AWIPS Linux Workstation Replacement
7	Equipment Code	AWIPS
8	Serial Number	001
15	Comments	Serial numbers of all newly installed LX workstations:
17a	Mod. No.	15B

A sample EMRS report is provided as attachment A.

Signature Not Verified

Mark S. Paese

Digitally signed by Mark S. Paese
DN: cn=Mark S. Paese, o=DOC/NOAA/NWS, c=US
Date: 2004.01.06 16:13:29 -05'00'

Mark S. Paese

Director, Maintenance, Logistics, and Acquisition Division

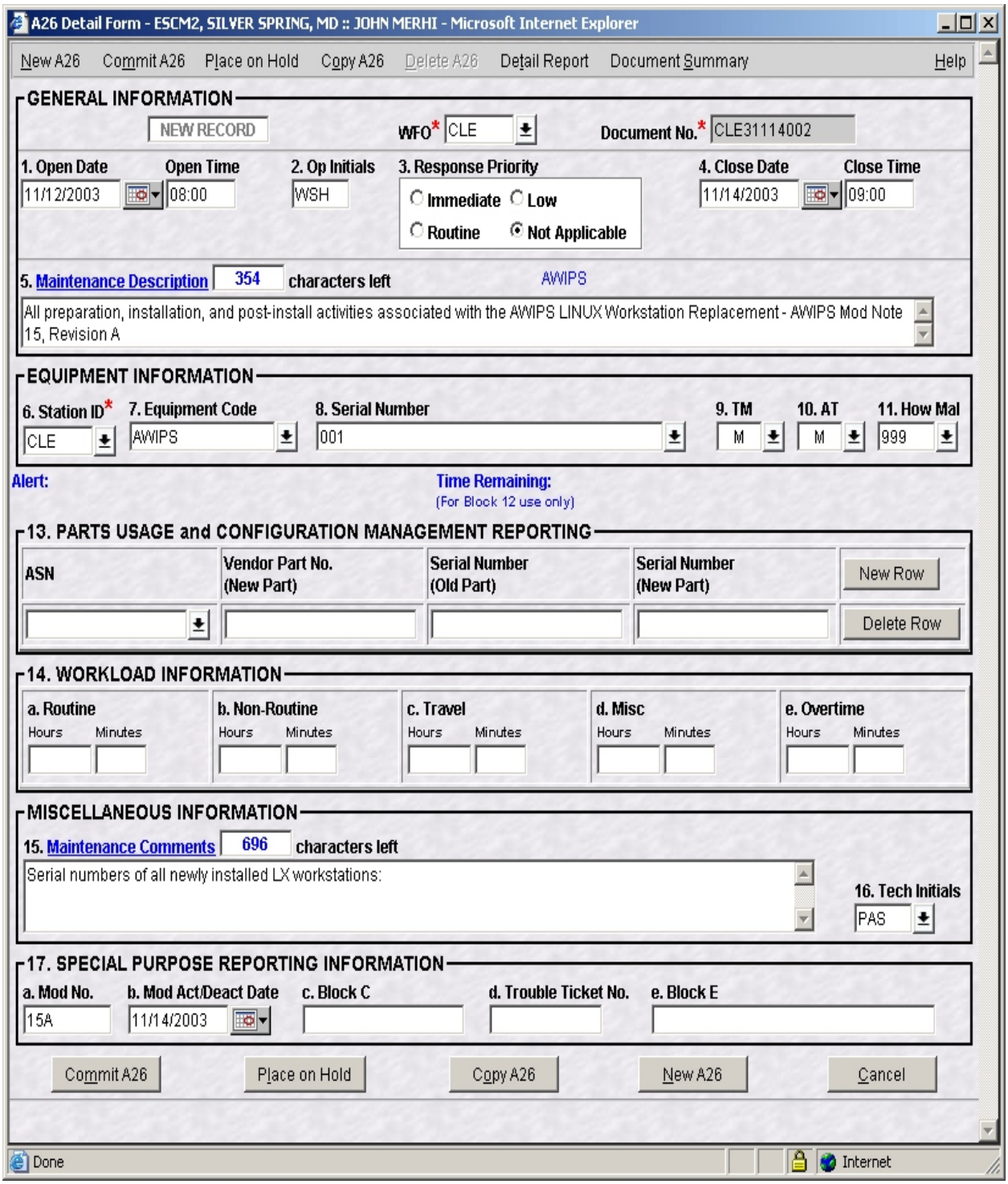
Attachment A - Sample EMRS Report

Attachment B - Testing Linux CD-RW Functionality

Attachment C - Site Specific Fixes

Attachment D - Service Backup Procedures

Attachment A - Sample EMRS Report



Attachment B - Testing Linux CD-RW Functionality

1. Log into the Linux workstation as `root`.
2. From the *System Menu*, select **Programs → Multimedia → X-CD-Roast**.

   A window displays with the message:

   No root configuration file found ....
3. Click the **OK** button. The main menu of the program displays.
4. Click the **Setup** button located on the left side of the screen. A new page labeled *Device-Scan* displays.
5. Select the device labeled **[2,0] LITE-ON** by clicking on it with the mouse pointer.
6. Click the second tab near the top of the screen, labeled **CD Settings**. In the *CD Writer Configuration* box move the writer speed slider to **24x**.
7. Click the third tab near the top of the screen, labeled **HD settings**.
8. Click the **Browse** button.
   1. Select the data directory and then click the **OK** button.
   2. Click the **Add** button. The data directory displays in the window labeled *Temporary Image Storage Directories*.
   3. Click the **Save Configuration** button and then **OK**.
   4. Click the **OK** button located on the left side of the screen. The main menu of the program displays.
9. Place a blank CD in the CD tray, shiny-side down.
10. Click the **Create CD** button located on the left side of the screen. The *Create CD* screen displays.
11. Click the **Master Tracks** button located on the left side of the screen.
12. In the right side view window labeled *File/Directory View*, select (by double-clicking on it with the mouse pointer) the following directories in the order listed:
    1. **awips**
    2. **fxa**
    3. **bin**.
13. Click the **Add** button located below the current view window.
14. Click the **OK** button. The *Session view* directory displays in the left side view window.
15. Click the fifth tab above the view window labeled **Create session image**. Underneath the tabs, two sets of tables display.

1. Under the table labeled *Create session on hard disk*, click the button labeled **Calculate size**. At the top, a window labeled *X-CD_Roast* displays. This window contains information about the size of the backup image about to be created.
2. Click the **OK** button at the bottom of the window and the *X-CD-Roast* window disappears.
3. Click **Master to image file** located at the bottom of the *Create session on hard drive* table. A window labeled *X-CD_Roast* displays at the top. Wait for the CD write to complete. Under the window label is a second line where *Mastering successful* displays with a view window containing information on the created master image.

16. Click the **OK** button located at the bottom of the pop-up window. The window disappears.
17. Click the **Write Tracks** button located on the left side of the screen. Two tables display in the middle of the screen: *Tracks to write* and *write parameters*.
18. Click the second tab (above the table, *Tracks to write*) labeled **Layout tracks**. A table displays, *Image - Information*, to the right of the table labeled *Tracks to write* replacing the *write parameters* table.
19. Select the image that appears in the *Image - Information* view window (there should be only one image in the window) by clicking on it with the mouse pointer.
20. Click the **Add** button at the bottom of the *Image - Information* view window. The selected image displays in the view window on the left labeled *Tracks to write* and appears grayed out in the view window on the right labeled *Image - Information*.
21. Click the **Accept track layout** button below both view windows. On the right side of the screen, the *Image - Information* table disappears and the write parameters table displays. In the view window labeled *Tracks to write* the image selected in step 19 is still visible.
    1. Click the button labeled **Write tracks** at the bottom of the window. A pop-up window displays:

       Please insert a CD-R/RW....
    2. Click the **OK** button. This window disappears. A new *X-CD-Roast* window displays with information on the status of the image as it is being written to the CD. Once the write to CD is completed, the CD tray opens
    3. Click the **OK** button and the pop-up window disappears.
22. Click the **Back to main menu** button located on the left side of the screen.
23. Click the **Exit** button located on the left side of the screen. A pop-up window displays:

    Do you really want to exit CD_Roast.
24. Click the **Yes** button to exit the program.

25. Review the contents of the CD by issuing the following commands:

    ```
    mount /mnt/cdrom
    cd /mnt/cdrom
    ll -R        (ll is “LL” not “11")
    ```

    A listing of the directories/files saved off displays.

26. Remove the CD by issuing the following commands:

    ```
    cd /
    eject cdrom
    ```

This completes the Linux CD-RW testing procedure.

Attachment C - Site Specific Fixes

This attachment discusses various site specific fixes.

Local applications accessing the Informix database

Sites that have programs accessing the Informix database might not be able to run those programs post-LX installations. An SQL module is needed to fix this problem. Log in to a terminal session and perform the following procedures to download and install the module:

```
ftp 165.92.25.15
ftp
passwd 4Awips!
cd home
get sqlcmd-72.tar
get sqlcmd.README
```

Sites that require Informix access within local applications from the Linux workstations can download this package and install it according to the included README file. Sites should install this package in their locally managed areas such as in `/home` or `/awips/dev` which are NFS-mounted to all the Linux workstations. Sites should not install this in `/usr/local` since that is a baseline managed area. They will need to have their local applications reference the final location of the binary depending on where they want to put it.

In OB3, sqlcmd will be installed in `/usr/local` on the Linux workstations as part of the baseline. Until then, sites can change their local application over to using the baseline instance if they wish.

Configuring LXs to support CWSUs

There are 21 AWIPS systems which have configured an HP workstation(s) to support their associated CWSU (see Table 1, page C-3). As these HP workstations are replaced by Linux workstations, the Linux workstations will require some minor changes to allow the replacement Linux workstations to support the associated CWSU.

Table 1 contains a listing of each AWIPS system which supports an associated CWSU. It also contains the site specific information about the CWSU specific router which allows each of these 21 AWIPS systems to communicate with their associated CWSU. In addition, it contains the IP address of their associated CWSU workstation.

The complete set of 4 configuration files that must be updated on the Linux workstation are:

1. `/etc/hosts`
2. `/etc/hosts.allow`
3. `/etc/sysconfig/static-routes`
4. `/awips/fxa/awipsusr/.rhosts`

1. To update the `/etc/hosts` file, add the following entry to the `/etc/hosts` file:

   xxx.xxx.xxx.xxx **cwsu3**

   where ***xxx.xxx.xxx.xxx*** is the IP address for the associated CWSU workstation as defined in Table 1.

   As an example, using AWIPS site VRH, the entry added to the `/etc/hosts` file is:

   172.16.4.2 **cwsu3**

2. To update the `/etc/hosts.allow` file, add the following entry to the `/etc/hosts.allow` file:

   xxx.xxx.xxx.xxx

   where ***xxx.xxx.xxx.xxx*** is the IP address for the associated CWSU workstation as defined in Table 1

   As an example, using AWIPS site VRH, the entry added to the `/etc/hosts.allow` file is:

   ALL: 127.0.0.1 165.92.146. 165.92.26. 165.92.30. ***172.16.4.2***

3. To update the `/etc/sysconfig/static-routes` file, add the following entry to the `/etc/sysconfig/static-routes` file:

   eth0 host ***xxx.xxx.xxx.xxx*** **gw** ***ggg.ggg.ggg.ggg***

   where ***xxx.xxx.xxx.xxx*** is the IP address for the associated CWSU workstation as defined in Table 1.

   where ***ggg.ggg.ggg.ggg*** is the IP address for the associated Gateway router to the CWSU workstation as defined in Table 1.

   Using AWIPS site VRH as an example, the entry added to the `/etc/sysconfig/static-routes` file is:

   eth0 host ***172.16.4.2*** **gw** ***165.92.146.40***

4. To update the `/awips/fxa/awipsusr/.rhosts` file, add the following entry to the `/awips/fxa/awipsusr/.rhosts` file:

   cwsu3

   To activate the updated files, reboot the Linux workstation and verify that the CWSU can start a D2D session. (A route to the CWSU can also be added by using the **route add -host** ***xxx.xxx.xxx.xxx*** **gw** ***ggg.ggg.ggg.ggg*** command but this command does not validate that the `/etc/sysconfig/static-routes` configuration file was updated properly).

Table 1: Sites hosting CWSUs

AWIPS System Hosting CWSU	CWSU ID	CWSU Location	HP Hosting CWSU	Suggested LX To Host CWSU	Gateway Router To CWSU	IP add. of CWSU Workstation
ABQ	ZAB	Albuquerque, NM	ws1-abq / ws4	lx1-abq / lx4	165.92.210.40	172.16.2.2
BOU	ZDV	Denver, CO	ws1-bou	lx1-bou	165.92.102.170	172.16.6.2
BOX	ZBW	Boston, MA	ws4-box	lx4-box	165.92.33.40	172.16.8.2
CLE	ZOB	Cleveland, OH	ws4-cle	lx4-cle	165.92.69.40	172.16.10.2
EAX	ZKC	Kansas City, MO	ws1-eax / ws2 / ws4 / ws5	lx1-eax / lx2 / lx4 / lx5	165.92.97.40	172.16.12.2
FFC	ZTL	Atlanta, GA	ws4-ffc	lx4-ffc	165.92.241.40	172.16.14.2
FWD	ZFW	Fort Worth, TX	ws6-fwd	lx6-fwd	165.92.209.40	172.16.16.2
HGX	ZHU	Houston, TX	ws2-hgx / ws3 / ws4 / ws5	lx2-hgx / lx3 / lx4 / lx5	165.92.215.40	172.16.18.2
IND	ZID	Indianapolis, IN	ws3-ind	lx3-ind	165.92.70.40	172.16.22.2
JAX	ZJX	Jacksonville, FL	ws2-jax	lx2-jax	165.92.246.40	172.16.24.2
LOT	ZAU	Chicago, IL	ws1-lot / ws2 / ws4 / ws5	lx1-lot / lx2 / lx4 / lx5	165.92.83.40	172.16.20.2
LOX	ZLA	Los Angeles, CA	ws5-lox / ws6	lx5-lox / lx6	165.92.165.40	172.16.26.2
LWX	ZDC	Washington, D.C.	ws5-lwx	lx5-lwx	165.92.52.40	172.16.28.2
MEG	ZME	Memphis, TN	ws5-meg / ws6	lx5-meg / lx6	165.92.232.40	172.16.30.2
MFL	ZMA	Miami, FL	ws1-mfl / ws5	lx1-mfl / lx5	165.92.248.40	172.16.32.2
MPX	ZMP	Minneapolis, MN	ws4-mpx	ws4-mpx	165.92.81.40	172.16.34.2
MTR	ZOA	Oakland, CA	ws6-mtr	lx6-mtr	165.92.168.40	172.16.36.2
OKX	ZNY	New York, NY	ws1-okx / ws3 / ws4	lx1-okx / lx3 / lx4	165.92.40.40	172.16.38.2
SEW	ZSE	Seattle, WA	ws5-sew	lx5-sew	165.92.138.40	172.16.40.2
SLC	ZLC	Salt Lake City, UT	ws4-slc	lx4-slc	165.92.193.40	172.16.42.2
VRH	ZAN	Anchorage, AK	ws2-vrh	lx2-vrh	165.92.146.40	172.16.4.2

Attachment D - Service Backup Procedures

Evaluation Criteria:	This test addresses all criteria related to requirements that AWIPS system equipment/software installed at an NWS site can be used in the conduct of NWS service operations.
Purpose:	Demonstrate AWIPS can be used to provide service backup for another site.
Success Criteria:	Verify - One workstation can be “configured” as though it were “at another office.”
	Verify - One person has been trained to perform the service backup functions.
	Verify - One or more staff can use some of that workstation’s capability to support service backup.
Resources:	Appropriate staff member(s) demonstrate AWIPS site service backup workstation capability and readiness.

Service Backup Procedure

CONDUCTED BY: _____ DATE/TIME: _____ ITERATION: _____

Step	Test Step	Demonstrate Use of Indicated AWIPS Capability or Functionality	Comments	WA Y/N
1.	Management/Lead Forecaster states the need to provide service backup for the other office.	"Re-configure/localize" the designated AWIPS workstation for this action.		
2.	Demonstrate use of workstation to prepare and issue the following products. a. Public product b. Aviation product c. Hydrology product d. Climate product e. Other	Use appropriate AWIPS capabilities on the designated workstation. Ensure workstation is set up properly to backup the other office's products.		
3.	Verify the following products were disseminated to at least one appropriate user. a. Public product b. Aviation product c. Hydrology product d. Climate product e. Other			
4.	Return to normal operations	"Re-configure/localize" the designated AWIPS workstation for this action.		

Witnessed: _____ Overall Outcome: [ ] Pass [ ] Suspend Date: _____